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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/832,884	04/12/2001	Steve M. Danziger	L/M-102-DIV	2718

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EXAMINER

PERT, EVAN T

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/832,884

Applicant(s)

DANZIGER ET AL.

Examiner

Evan Pert

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/2/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant is reminded that, in order to be awarded a patent to claims for a novel "end use device," applicant must clearly and distinctly claim the *structure* of the device [see MPEP 2113].

In the instant case, applicant claims *structure* by "optional connections" (claim 1), "testing prior to mounting" (claim 1), "testing by wire bond or by solder ball connections" (claim 1) and statements like "remaining pristine *until* connected" (claim 2).

What is the structure of the claimed device without talking about what testing of the device occurred in the past? What is the structure of the device *when we look at it now*? What *does* the claimed device look like, regardless of process steps were executed to make it?

In claim 5, wire bond connections are "not removed," which is confusing because there seem to be wire bond connections claimed in claim 1. How can an end-use device *structure* have connections in the independent claim and also "not have connections" in the dependent claim?

In claim 2, there is lack of antecedent basis for "the stress tolerant."

Examiner's Interpretation of Claimed Structure

Since applicant's product-by-process language is confusing as to a clearly definable, distinguishable and observable structure, as claimed, the examiner sets forth the following structure as being included in intended scope, for purposes of examination:

Claims 1 and 2 = A device including a known good die (KGD) with a solder ball array and wire bond pad array on the KGD wherein the solder ball array was pristine from not being contacted during testing and is connected in a final use, while the wire bond pads have bond wires attached (which confirmed that the die is a KGD), not connected in a final use.

Claim 3 = Further limitation that the pad array and the ball array are on the same side of the KGD.

Claim 4 = Further limitation that the pad array and the ball array are in a same plane of space on the KGD.

Claims 5 and 6 = Further limitation that there is structural evidence of previous wire bonding to the pads of the KGD.

Claims 7 = Further limitations that the ball array is suitable for executing a controlled collapse chip connection.

Claim 8 = Further limitation that the ball array is configured as a stress tolerant ball array.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 3, 4, 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 10-135281 (previously of record in paper no. 7).

Regarding claims 1 and 2, the '281 document teaches an "end use device" (i.e. a device that is ready for sale and connection to a pristine BGA in a final use] with KGD 1 [0018] having a pristine BGA 23 (untouched by testing means and not damaged per last sentence of JPAB abstract) and testing wire bond pad connections (i.e. wires 4 bonded to pads 22 on KGD).

Regarding claim 3, the BGA 23 and wire bond connections at pads 22 are "on the same side of" IC die 1.

Regarding claim 4, the BGA and wire bond connections at pads 22 are "in the same plane of space on the KGD.

Regarding claims 5 and 6, pads 22 have metallurgical connections and pads 22 have not been removed from the die [Fig. 1].

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over the JP '281 document, as applied to claim 1 above, and further in view of L.S. Goldman (1972 article, previously of record in paper no. 7).

The JP '281 document is silent about controlled chip collapse connections (i.e. C4).

Goldman teaches that "one of the most significant advantages of using C4 is the ability to correct misregistration [text beginning under Fig. 1 at left column of p. 332].

It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to adopt C4, motivated by the "ability to correct misregistration" as disclosed by Goldman.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over the JP '281 document, and further in view of Official Notice.

The JP '281 document is silent about the solder ball connections being stress tolerant.

The examiner takes Official Notice that stress tolerant solder ball connections were known to the ordinary of skill at the time of filing the instant invention.

It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to use "stress tolerant" type of solder balls to achieve stress solder ball connections of the BGA. One of ordinary skill in the art would have been motivated to adopt stress tolerant solder ball arrangements to avoid an electrical connection failure from stress of the ball connections occurring from thermal cycling in the end-use product, for example.

Response to Arguments

6. Applicant continues with product-by-process claim language to describe alternative embodiments of 1) devices having BGA and test wire bond pads and 2) devices having wire bond pads and a test BGA. Applicant should break these embodiments into separate claim groupings, for clarity in the claims.

7. Applicant should adopt language that positively recites structure to overcome rejections under 35 USC 112, 2nd paragraph. The examiner continues to be confused about the boundary of scope of *structure*. See MPEPE 2113.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Pert whose telephone number is 703-306-5689. The examiner can normally be reached on M-F (7:30AM-3:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 703-308-1233. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0956.

ETP

September 8, 2003



**EVAN PERT
PRIMARY EXAMINER**